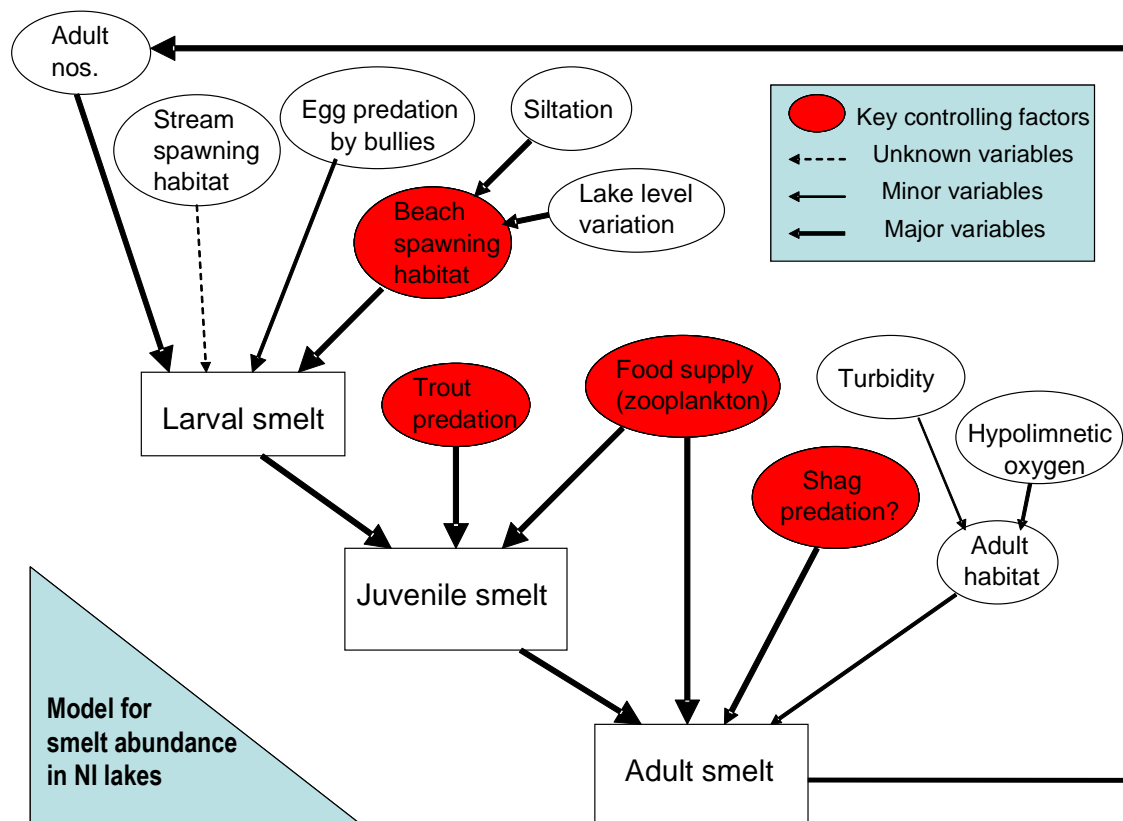


Smelt Conceptual Model

Dave Rowe

The figure below describes the current understanding of factors influencing the distribution and abundance of smelt in the Te Arawa lakes. The model identifies key controlling factors (beach spawning habitat, trout predation, food supply and shag predation) which together contribute to the quality and quantity of smelt in the lakes. Other factors are also known to be important (white boxes). The arrows describe the relationships between factors and their relative importance. A description of each of these variables is listed in the table below. This model can be used to identify possible management priorities, as well as test hypotheses and provide research ideas.

For a more detailed description of factors influencing koura in the Te Arawa lakes refer to Rowe D; Kusabs I (2007) Taonga and mahinga kai species of the Te Arawa lakes - smelt. (https://www.niwasience.co.nz/maori/research/te_arawa_lakes/smelt)



Variable name	Variable description
Adult nos	Number of adults
Stream spawning habitat	Spawning may occur in lake inlet streams
Egg predation by bullies	May be a significant factor
Siltation	Reduces spawning habitat by smothering sand substrates
Lake level variation	Required to maintain clean sandy substrate for spawning
Beach spawning habitat	Knowledge of location, size and use of beach spawning habitat lacking
Trout predation	Trout predation, seasonal changes in food supply and shag predation may interact to reduce smelt numbers
Food supply (zooplankton)	May be seasonal limitations
Shag predation?	May be important in shallow lakes
Turbidity	May cause indirect effects
Hypolimnetic oxygen	Adults affected by low oxygen in the hypolimnion
Adult habitat	Area available may be influenced by increased turbidity and low oxygen